Amendments to the Claims

This listing of claims will replace all prior versions, and listing, of claims in the application.

Listing of Claims:

1. (Currently Amended) A ~~system for designing a gear driving system, said~~ gear-driving-system designing system, comprising:

a setting section for setting ~~a~~ one or more gear characteristic ~~value~~ values for ~~a~~ the gear driving system, the gear characteristic value indicating characteristics of a final gear and a driving gear in a gear driving system and required for simulation of an oscillation in the final gear of the gear driving system;

a calculating section for simulating an oscillation in ~~a~~ the final gear of the gear driving system, based on the one or more gear characteristic ~~value~~ values set in the setting section;

a judging section for judging whether or not the simulated oscillation in the final gear as determined by the ~~simulation in the~~ calculating section is within an acceptable range; and

a setting changing section for changing any one or more of the one or more the gear characteristic values previously ~~value~~ set in the setting section, when the judging section judges that the simulated oscillation in the final gear does not fall within the acceptable range.

2. (Currently Amended) The gear-driving-system designing system as set forth in claim 1,

wherein the calculating section includes:

an equation creating section for creating an equation of oscillation motion for a predetermined oscillation system in the gear driving system, using the one or more gear characteristic ~~value~~ values as set in the setting section; and

an equation analyzing section for solving the created equation of oscillation motion ~~created by the equation creating section,~~ so as to determine an oscillation frequency and an oscillation amplitude of the oscillation system, and

wherein the judging section judges that the simulated oscillation in the final gear is within the acceptable range when at least one of the oscillation frequency and the oscillation amplitude is determined by the equation analyzing section to fall within the acceptable range.

3. (Original) The gear-driving-system designing system as set forth in claim 2, wherein the oscillation system used in the equation creating section is a gear pair of the final gear and a driving gear of the final gear in the gear driving system.

4. (Currently Amended) A program for causing a computer to ~~perform: operate as:~~

a setting step of setting a gear characteristic value, which is a value indicating characteristics of a final gear and a driving gear of a gear-driving system and required for simulation of an oscillation in the final gear of the gear driving system; ~~a setting section for setting a gear characteristic value for a gear driving system;~~

~~a~~ calculating ~~section for~~ a calculating step of simulating an oscillation in ~~a~~ the final gear of the gear driving system, based on the gear characteristic value set in the setting step; ~~section;~~

a judging step of ~~section for~~ judging whether or not the oscillation in the final gear determined by the simulation in the calculating ~~step section~~ is within an acceptable range; and

a setting changing step of ~~section for~~ changing the gear characteristic value set in the setting step, ~~section, when~~ it is judged in the judging ~~section judges~~ that the oscillation in the final gear does not fall within the acceptable range.

5. (Currently Amended) The program as set forth in claim 4,

wherein the calculating ~~step section~~ includes:

an equation creating step of ~~section for~~ creating an equation of oscillation motion for a predetermined oscillation system in the gear driving system, using the gear characteristic value set in the setting step; ~~and~~section; ~~and~~

an equation analyzing ~~step of section for~~ solving the equation of oscillation motion created by ~~in~~ the equation creating ~~step, section,~~ so as to determine an oscillation frequency and an oscillation amplitude of the oscillation system, and

wherein ~~when it is judged in~~ the judging ~~step section judges~~ that the oscillation in the final gear is within the acceptable range when at least one of the oscillation frequency and the oscillation amplitude determined ~~in by~~ the equation analyzing ~~step section~~ fall within the acceptable range.

6. (Currently Amended) The program as set forth in claim 5, wherein the oscillation system used in the equation creating ~~step section~~ is a gear pair of the final gear and a driving gear of the final gear in the gear driving system.

7. (Currently Amended) A ~~method for designing a gear driving system, said gear-driving-system~~ designing method, comprising:

a setting step of setting ~~a one or more~~ gear characteristic ~~value~~ values for ~~a~~ the gear driving system, ~~the gear characteristic value indicating characteristics of a final gear and a driving gear in a gear driving system and required for simulation of an oscillation in the final gear of the gear driving system;~~;

a calculating step of simulating an oscillation in ~~a~~ the final gear of the gear driving system, based on the ~~one or more~~ gear characteristic ~~values value being set, in the setting step;~~

a judging step of judging whether or not the ~~simulated~~ oscillation in the final gear is determined ~~to be by the simulation in the calculating step is~~ within an acceptable range; ~~and~~

a setting changing step of changing and resetting ~~any one or more of the one or more~~ the gear characteristic ~~values value previously set, in the setting step,~~ when the judging step judges that the ~~simulated~~ oscillation in the final gear does not fall within the acceptable range;~~;~~

wherein the setting changing step, the calculating step, and the judging step being repeated until the simulated oscillation in the final gear is judged to fall within the acceptable range in the judging step, and

outputting the one or more gear characteristic values corresponding to the simulated oscillation he judged value being outputted as an optimum gear characteristic values when the simulated oscillation in the final gear being judged, is judged to fall within the acceptable range.

8. (Currently Amended) The gear-driving-system designing method as set forth in claim 7,

wherein the calculating step includes:

an equation creating step of creating an equation of oscillation motion for a predetermined oscillation system in the gear driving system, using the one or more gear characteristic ~~value~~ values being set; and

an equation analyzing step of solving the created equation of oscillation motion created ~~by the equation creating step,~~ so as to determine an oscillation frequency and an oscillation amplitude of the oscillation system, and

wherein the judging step judges that the simulated oscillation in the final gear is within the acceptable range when at least one of the oscillation frequency and the oscillation amplitude is determined by the equation analyzing step to fall within the acceptable range.

9. (Original) The gear-driving-system designing method as set forth in claim 8, wherein the oscillation system used in the equation creating step is a gear pair of the final gear and a driving gear of the final gear in the gear driving system.

10. (New) The gear-driving-system designing system as set forth in claim 1, wherein when the setting changing section causes the changing of any gear characteristic values previously set in the setting section, the setting changing section also causes the calculating

section to simulate another oscillation in a final gear of the gear driving system, based on the changed one or more gear characteristic values set in the setting section by the setting change section and the judging section judges whether or not the another simulated oscillation in the final gear as determined by the calculating section is within an acceptable range and the setting changing section changes any one or more of the previously changed gear characteristic values previously set in the setting section, when the judging section judges that the oscillation in the final gear does not fall within the acceptable range.

11. (New) The gear-driving-system designing system as set forth in claim 10, further comprising an output unit that outputs the one or more gear characteristic values as set in the setting section when the judging section determines that the simulated oscillation is within the acceptable range or the one or more changed gear characteristic values when the judging section determines that the another simulated oscillation is within the acceptable range.

12. (New) The gear-driving-system designing system as set forth in claim 1, wherein a plurality of gear characteristic values are set by the setting section for the gear driving system.

13. (New) A program that is stored in one of a static storage medium, a dynamic storage medium or a storage area of a computer system, the program including instructions and criteria for:

setting one or more gear characteristic values for a gear driving system;

simulating an oscillation in a final gear of the gear driving system, based on the one or more gear characteristic value set in the setting section;

judging whether or not the simulated oscillation in the final gear is within an acceptable range; and

changing any one or more of the one or more gear characteristic values previously set in the setting section, when the judging section judges that the simulated oscillation in the final gear does not fall within the acceptable range.

14. (New) The program as set forth in claim 13, wherein:

said simulating an oscillation includes instructions and criteria for:

creating an equation of oscillation motion for a predetermined oscillation system in the gear driving system, using the one or more set gear characteristic values, and

solving the created equation of oscillation motion, so as to determine an oscillation frequency and an oscillation amplitude of the oscillation system; and

said judging includes instructions and criteria for:

judging the oscillation in the final gear as being within the acceptable range when at least one of the oscillation frequency and the oscillation amplitude determined by the equation analyzing section fall within the acceptable range.

15. (New) The program as set forth in claim 14, wherein the oscillation system in the gear driving system of said creating is a gear pair of the final gear and a driving gear of the final gear in the gear driving system.

16. (New) The program as set forth in claim 13, further comprising instructions and criteria for:

causing said simulating to be repeated so as to simulate another oscillation in a final gear of the gear driving system, based on the changed one or more gear characteristic values;

causing said judging to be repeated so as to judge whether or not the simulated oscillation in the final gear is within an acceptable range; and

in the case where it is judged that the another simulated oscillation is not within the acceptable range, changing any one or more of the one or more changed gear characteristic values.

17. (New) The program as set forth in claim 13, further comprising instructions and criteria for:

in the case where it is judged that the simulated oscillation is within the acceptable range, providing an output of the one or more gear characteristic values on which the simulated oscillation was based.

18. (New) The gear-driving-system designing system as set forth in claim 1,

wherein the judging section judges that the simulated oscillation in the final gear is not within the acceptable range when both of the oscillation frequency and the oscillation amplitude are determined by the equation analyzing step to be outside the acceptable range.

19. (New) The gear-driving-system designing method as set forth in claim 7 wherein the judging step judges that the simulated oscillation in the final gear is not within the acceptable range when both of the oscillation frequency and the oscillation amplitude are determined by the equation analyzing step to be outside the acceptable range.

20. (New) The program as set forth in claim 13, wherein said judging includes instructions and criteria for:

judging the oscillation in the final gear as not being within the acceptable range when both of the oscillation frequency and the oscillation amplitude are determined by the equation analyzing section to be outside the acceptable range.

21. A program for designing a gear driving system in combination with a computer, said program for execution on the computer and comprising instructions and criteria for:

setting one or more gear characteristic values for the gear driving system;

simulating an oscillation in a final gear of the gear driving system, based on the one or more gear characteristic values set in the setting step;

judging whether or not the simulated oscillation in the final gear determined by the simulation in the calculating step is within an acceptable range;

changing and resetting any one or more of the one or more gear characteristic values previously set, when said it is judged that the simulated oscillation in the final gear does not fall within the acceptable range;

wherein said setting changing, simulating and judging is repeated until the simulated oscillation in the final gear is judged to fall within the acceptable range, and

outputting the one or more gear characteristic values corresponding to the simulated oscillation be judged as optimum gear characteristic values when the simulated oscillation in the final gear being judged, is judged to fall within the acceptable range.

22. (New) The gear-driving-system designing system as set forth in claim 1, wherein:

the gear characteristic value includes at least one of (i) the number of teeth, (ii) module, (iii) twist angle, (iv) pressure angle, and (v) tooth width of each of the final gear and the driving gear of the final gear.

23. (New) The program as set forth in claim 4, wherein:

the gear characteristic value includes at least one of (i) the number of teeth, (ii) module, (iii) twist angle, (iv) pressure angle, and (v) tooth width of each of the final gear and the driving gear of the final gear.

24. (New) The gear-driving-system designing method as set forth in claim 7, wherein:

the gear characteristic value includes at least one of (i) the number of teeth, (ii) module, (iii) twist angle, (iv) pressure angle, and (v) tooth width of each of the final gear and the driving gear of the final gear.

25. (New) A computer-readable recording medium for storing the program as set forth in claim 4.